

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
18 August 2005 (18.08.2005)

PCT

(10) International Publication Number  
**WO 2005/076285 A1**

(51) International Patent Classification<sup>7</sup>: **G21C 9/016**

(74) Agent: **C & S PATENT AND LAW OFFICE**; C-2306  
Daelim Acrotel, 467-6 Dogok-dong Kangnam-gu, Seoul  
135-971 (KR).

(21) International Application Number:  
**PCT/KR2005/000369**

(22) International Filing Date: 7 February 2005 (07.02.2005)

(25) Filing Language: **Korean**

(26) Publication Language: **English**

(30) Priority Data:  
10-2004-0008767

10 February 2004 (10.02.2004) **KR**

(71) Applicants (for all designated States except US): **KO-  
REA ATOMIC ENERGY RESEARCH INSTITUTE**  
[KR/KR]; 150 Dukjin-dong Yusung-gu, Daejeon 305-353  
(KR). **KOREA HYDRO & NUCLEAR POWER CO.,  
LTD.** [KR/KR]; 167 Samsung-dong Kangnam-gu, Seoul  
137-791 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SONG, Jin-Ho**  
[KR/KR]; 108-701 Expo Apt., Jeonmin-dong, Yusung-gu,  
Daejeon 305-761 (KR). **KIM, Hwan-Yeol** [KR/KR];  
119-105 Hanbit Apt., Eoeun-dong, Yusung-gu, Daejeon  
305-755 (KR). **MIN, Beong-Tae** [KR/KR]; 103-1301  
Hanbit Apt., Eoeun-dong, Yusung-gu, Daejeon 305-755  
(KR). **KIM, Hee-Dong** [KR/KR]; 132-603 Hanbit Apt.,  
Eoeun-dong, Yusung-gu, Daejeon 305-755 (KR).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,  
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,  
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,  
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: **PASSIVE COOLING AND ARRESTING DEVICE FOR THE MOLTEN CORE MATERIAL**

(57) Abstract: Provided is an apparatus for passively cooling and retaining molten core material discharged from a damaged reactor vessel during a severe accident in the nuclear plant. The apparatus comprises: a molten core material retention tank to retain molten core material; a compressed gas tank storing high-pressure inert gas; a cooling water storage tank being installed higher than the molten core material retention tank; and a mixing means. The molten core material retention tank includes an outer retention vessel having at least one coolant hole, a porous protection vessel formed at an inside of the outer retention vessel, and a gravel layer formed between the outer retention vessel and the porous protection vessel. The apparatus can be installed in a reactor cavity without changing the compartment structure of a containment building, and makes it possible to prevent a steam explosion during the cooling process for the ultrahigh-temperature molten core material and to secure the reliability of the cooling process.



**WO 2005/076285 A1**